

# EXHIBIT 81

# Accidental explosions: gunpowder in Tudor and Stuart London

Gunpowder detonation in London is most commonly associated with an explosion that never happened: the thwarted 1605 gunpowder plot. Yet, argues Stephen Porter, accidental explosions were an ever-present threat in Tudor and Stuart London...

Published: September 22, 2016 at 4:03 pm

Gunpowder explosions were unique in their suddenness. Floods could be predicted from the level of the Thames and the timing of high tide, epidemics spread gradually, and lightning strikes originated from storms that could be seen and heard in advance. Gunpowder, however, gave no such warnings.

These disasters were frightening because they could not be predicted and therefore avoided. Although they occurred only occasionally, the risk of accidental explosions was ever-present and surely contributed to citizens' feelings of vulnerability during the Tudor and Stuart periods. Gunpowder usage

From the early 13th century, when gunpowder was first developed in Europe as an explosive substance, it was used as a propellant for projectiles fired from guns, or for the destruction of vast solid objects, such as buildings or rock formations.

Demand for the substance rose inexorably during the 16th and 17th centuries – thanks, in part, to the great increase in shipping and the expansion of armies and navies. Most large merchant vessels carried some cannon as a defence against privateers and pirates. By the early 15th century guns were being made that were small enough to be fired by a single man and powder was also sold to individual customers, for hand-guns and larger pieces, for self-defence and hunting.

More like this



### **Goods & globalisation: merchants in Tudor & Stuart England**

Fireworks and small squibs [small fireworks that burn with a hissing sound] were also developed. As the Lord Mayor's Show grew from the late 16th century, it saw the consumption of gunpowder in the many ship's cannon fired on the river, and fireworks became a central part of the show's lively entertainments.

Gunpowder was a commercially traded product and England was both a maker and importer. As England's greatest trading hub, London stood at the centre of the gunpowder trade.

*A figure of a dragon breathing fire is attached to a rocket tied to a rope stretched between two buildings in this 1628 woodcut. (Universal History Archive/Getty Images)*

#### **A dangerous substance**

As well as its explosive power, gunpowder had the significant asset of detonating instantly. Contact with just a spark could ignite the whole charge. Yet this could also be a great danger. While it was stable if left untouched, gunpowder's remarkable sensitivity to flame made it dangerous to move, store or prepare for use. A moment of carelessness or a simple mishap could have deadly consequences. In 1595 it was described as "an unmerciful thing, if any chimney... should take fire, and sparkes fly, or a flint stone strike fire".


Safety in handling gunpowder was achieved by storing it in enclosed rooms without naked flames; light would be provided by lanterns placed behind internal glass windows. Those working with gunpowder did not carry or wear any metal objects and wore felt slippers, in case the nails in their boots should strike a spark. Rope, rather than iron hoops, was used to bind gunpowder barrels and wadding was placed around them during transportation.

*Woodcut showing a man testing saltpetre, a substance used to make gunpowder and preserve meat. (SSPL/Getty Images)*

The government's stocks of gunpowder were kept in its arsenal in the Tower of London. By the mid-1630s many spaces in the Tower were used for gunpowder storage, including the vault under the Master of the Ordnance's own lodgings. Powder rooms in the White Tower contained more than 2,100 barrels of gunpowder, and were protected by reducing the window openings to narrow slits.

As it became common for ships to mount artillery, warehouses near the quayside became regular places for storing gunpowder, yet rather alarmingly, the substance was also stored within buildings used for other purposes. In 1612, the Clothworkers Company's hall in Mincing Lane was described as containing a gallery, on the side of which were a chimney and two gunpowder houses. Even more of a public risk was a warehouse on Tower Hill, where, in 1586, more than 800 barrels of powder were being stored in a place where, "rogues and vagabonds oftentimes lodge in the night and burn straw to warm themselves".

### Accidents

Despite attempts to store gunpowder safely, accidents were not uncommon. Dangers abounded at  gunpowder houses' within the city where the powder was processed. Not only was there a high risk of accidental ignition, the substance was also prone to spoil, through damp and the deterioration of the mixture.

In a building on Tower Hill in 1552, seven men were killed and eight injured when a spark fell into a container of gunpowder. Just a few years later, in 1560, a gun was fired near premises containing gunpowder in Crooked Lane, just north of London Bridge, detonating two barrels. Four houses were wrecked, with others damaged. Eleven people were killed and 17 more injured.

In April 1583 an explosion in Fetter Lane destroyed not just the gunpowder house it originated in, but also other houses in the street, causing damage over a much wider area. "The monstrous and huge blast of the gunpowder" broke windows in the church of St Andrew's,



150 yards from Fetter Lane, and at the chapel at Lincoln's Inn, a quarter of a mile in the opposite direction. Despite the extent of the destruction, only two men and one woman were killed. Others were burned by the flames, or injured by falling timbers in the damaged buildings, yet a child in the building where the explosion occurred escaped unharmed.

The cause of such accidents was rarely known, for those who made the mistake that ignited the gunpowder were generally killed. Yet in the case of Robert Porter's premises in Tower Street in 1650, the circumstances leading to the disaster were established, although not the immediate cause. Porter had 27 barrels of gunpowder stored in his house. Twenty had been sold to a ship's master, and as they were to be collected the next day, Porter had left them in the shop rather than the usual safer storage place. The explosion, and the following fire, which raged for two hours, killed 67 people, including the five who lived at the house. Fifteen houses were wrecked in total, and at least 100 more had tiles blown off the roofs, windows broken and other damage. The tower of All Hallows Church, opposite Porter's house, was so badly damaged that, despite repairs, it had to be rebuilt in 1659.

After the Great Fire of 1666, regulations concerning new buildings were issued, designed to prevent multiple house-fires. Yet in 1715, a blaze in Thames Street spread and destroyed more than 100 houses in the vicinity, as well as gutting the new Custom House. It began when a boy making fireworks in his father's gunpowder shop accidentally caused a detonation that blew up the house. Just three years later, 17 people were killed in an explosion at a brass foundry in Moorfields, where a crowd had gathered to watch captured French guns being recast.

Explosions also occurred on ships, and as the noise was not cushioned by surrounding buildings, these detonations must have been as alarming to the citizens as those in gunpowder houses or merchants' warehouses. In 1654, a ship on the Thames blew up when a pot of pitch being heated on deck caught fire. As the flames spread, the crew let the ship drift away from other vessels until it beached on the Southwark side, near St Olave's church. The explosion when the fire

reached the ship's gunpowder “made a terrible noise, and shook the houses thereabouts”. All of the church’s windows were broken and eight people were killed, most of them hit by flying debris. By chance, another ship blew up the following day, damaging houses near the shore.

Even within the Tower of London there were occasional lapses in safety. In 1548 an explosion there killed a prisoner and seriously damaged the structure. The serious risk was underlined again in July 1691, when 2,000 gunpowder barrels fell through a wooden floor in the White Tower. Either the powder did not spill out of the barrels, or there was no spark or flame to detonate it, and so a potentially devastating accident was luckily avoided.

*The Tower of London, which was used for storing gunpowder. (Print Collector/Getty Images)*

Other cities also suffered from major explosions during the period, including Basel (1526), Luxembourg (1554), Venice (1569), Dublin (1597), Delft (1654) and Leiden (1807). Between 1400 and 1850, there were more than 20 major explosions in European cities and towns.

### Precautions

The catastrophic fall-out of accidents such as these prompted the Privy Council and government to issue orders to make the storage and movement of London’s gunpowder safer. The detonation in Crooked Lane prompted the city’s corporation in 1580 to prohibit gunpowder storage in houses in the city [this was modified three years later to allow 2lbs of powder to be stored at any time, as long as it was kept in powder horns that were not placed near a street frontage]. After the 1650 disaster in Tower Street, parliament ordered the committee of the army and the city’s corporation to consider “the best ways for avoiding all mischiefs and inconveniences that may happen by powder, and other combustible matter, in private houses and other magazines within the city of London”.

From the mid-17th century, gunpowder magazines began to be housed in purpose-built structures, rather than in adaptations of existing

buildings. These were designed to minimise the chance of an explosion. They were placed some distance from other buildings and surrounded with an earth bank, limiting the impact should an accident happen. However, most of these specialist magazines were built for the use of the armed forces and the citizens' militia, not for private stores or trading companies.

*A master gunner firing a cannon by applying fire to the breech, in a 1590 woodcut. (Universal History Archive/Getty Images)*

Such precautions were often ineffectual, however, because gunpowder was in such widespread use and control of the commercial side of its dealing and transporting was difficult. Even the response to a perceived danger could be lukewarm. In 1635, city justices were informed that a gunpowder house had been moved to a site near Clement's Inn, close to houses and footpaths, alarming nearby residents and walkers. Yet rather than issuing a peremptory order to close the house, the justices simply decided to inspect it and order its removal if they found it to be dangerous.

A 1719 parliamentary order that restricted the amount of gunpowder stored in a building was equally ineffective. A building could simply be divided by a new wall, thereby doubling the quantity allowed, and subdivided again for further storage. These problems were recognised in a supplementary Act of Parliament five years later, and restrictions on the amount of powder that could be stored were reiterated in 1742.

The incidence of explosions did decline during the 18th and 19th centuries, but the danger had not gone away – there was a detonation on the Regent's Park Canal as late as 1874.

**Stephen Porter is the author of [\*The Story of London: From its Earliest Origins to the Present Day\*](#), published in January 2016 by Amberley.**

# EXHIBIT 82



# The AR-15 Controversy

Semiautomatic Rifles and  
the Second Amendment

Danish B. Chaudhary





Dennis Chapman graduated from the United States Military Academy at West Point and served with the U.S. Army during Operation Restore Hope, Somalia and Operation Iraqi Freedom, the latter with a brigade comprised mostly of former Kurdish Peshmerga. He graduated from Thomas M. Cooley Law School and practices law in Virginia.

Taking a multidisciplinary approach, this book examines common assumptions about the capabilities, applications, utility, and lethality of semiautomatic rifles such as the AR-15. Informed by multiple domains including law, criminology, military doctrine, personal safety, and recreation, this book explores topics such as whether or not the AR-15 is, in fact, a "weapon of war"; whether such firearms are more lethal in the hands of criminals than other firearms; and the utility of the AR-15 and similar rifles in legitimate civilian shooting applications including self-defense, targeting shooting, competitive shooting, hunting, and collecting. Topics include firearms technology in the courts; the movement to ban the AR-15; military vs. civilian firearms; the emergence of semiautomatic firearms technology; the specific features of the AR-15 and other "assault-style" firearms; infantry combat and violent crime compared; and the prevalence of the AR-15 and similar firearms as civilian self-defense and sporting arms



**The AR-15 Controversy:  
Semiautomatic Rifles and the Second  
Amendment**

**Dennis P. Chapman**



To Charles Minot "Minnie" Dole, and those that volunteered, and  
those that never came home.



*Vires Montesque Vincimus*

Third Brigade Press, Springfield Virginia, USA

First Edition June 2021

(2<sup>nd</sup> Revision 01/22)

Copyright © 2021, 2022 by Dennis P. Chapman  
All rights reserved.

ISBN-13 978-0-578-92803-6



Representative Grayson's 700 rounds per minute, respectively.<sup>131, 132</sup> For the venerable M1 Garand, the semiautomatic mainstay of US forces during the Second World War and after, estimated rates of fire range from about twelve rounds per minute in 1958<sup>133</sup>, to 16—24 round per minute (for an average of 20) in 1965—35 times slower than Representative Grayson's 700 rounds per minute.<sup>134</sup>

### Mischaracterizing the Purpose of Pistol Grips and Handguards

Gun control activists have compounded their exaggerations about AR-15 rates of fire by falsely characterizing the purpose of certain features to make them seem more dangerous than they actually are. The archetypal example of this is their obsession with pistol grips. It will come as a surprise to many that the term "pistol grip" is actually more ambiguous than gun control proponents know. As traditionally understood before the AR-15 and other semiautomatic rifles became controversial, a pistol grip was "*the curved part of the stock behind & below the action on the rifle or shotgun*" (emphasis added)<sup>135</sup>—in other words, a "pistol grip" as traditionally understood was simply the breach-end grip on what gun control advocates would view as a traditionally configured rifle, as opposed to the handguard or forearm where the shooter grips the firearm forward of the trigger.

<sup>131</sup> FM 23-8, May 1965, 5; FM 23-8, April 1974, 7.

<sup>132</sup> In fact, one early reference on the M14 Rifle rated its capabilities somewhat lower, listing its maximum effective rate of fire in semiautomatic mode as 20 – 30 rounds per minute and its sustained rate as 8 – 10 rounds per minute, "[b]ased on limited tests." FM 23-8, US Rifle 7.62MM M14 (Department of the Army, December 1959, reprinted by Normount Armament Company), 5.

<sup>133</sup> Extrapolated from a rapid fire drill in which nine rounds are fired in 50 seconds. FM 23-5, US Rifle Caliber 30, M1 (Department of the Army, September 1958), 124.

<sup>134</sup> FM 23-5, US Rifle Caliber 30, M1 (Department of the Army, May 1965), 3.

<sup>135</sup> R. A. Steindler. *The Firearms Dictionary* (Stackpole Books, 1970), 114 – 115.

attributed to AR-15 rifles by Representative Grayson is almost 13 times faster than an AR-15 can *effectively* fire. Some versions of the M16, such as the M16A2, are configured to fire three-round bursts. Even for these rifles, the maximum effective rate of fire in burst mode is 90 rounds per minute—twice the maximum effective rate of fire of the semiautomatic AR-15.<sup>128</sup>

Even this does not tell the full story of the extent to which gun control advocates like Representative Grayson—whether willfully or out of ignorance—have exaggerated the capabilities of the AR-15. The rates of fire set forth above are *maximum* rates, to be employed for short durations only. The sustained rate of fire for an both the M16 and the AR-15—the rate at which they can fire for an indefinite period without overheating—is 12 to 15 rounds per minute,<sup>129</sup> for an average of 13.5 rounds per minute—*almost 52 times slower* than the 700 rounds per minute claimed for the AR-15 by Representative Grayson.

Semiautomatic rifles such as the AR-15 cannot even approximate—much less replicate—the effective rates of fire of machineguns or selective fire weapons, and they cannot even remotely approach the extreme capabilities that some poorly informed commentators attribute to them. This observation is not limited to the AR-15. The "rate of effective sustained fire [was] about 40 rounds per minute" in semiautomatic mode for the selective fire M1918 BAR<sup>130</sup>—less than one seventeenth of Representative Grayson's alleged 700 rounds per minute; the selective fire M14 Rifle in semiautomatic mode had a maximum effective rate of fire of approximately 40 rounds per minute, with a sustained rate of fire of fifteen rounds per minute—17.5 and 46.7 times slower than the

<sup>128</sup> FM 3-22.9(FM 23-9), April 2003, with changes 1–4, 2-1.

<sup>129</sup> *Id.*; FM 23-9, January 1965, 4; FM 23-9, July 1966, 5; FM 23-9, March 1970, 4; FM 23-9, June 1974, 6; FM 23-9, July 1989, 2-3; SH 21-25, March 1985, 39; M16A1 Operator's Manual, 1975, 1; *Professional Facts for Infantry Combat Platoon Leaders*, 30.

<sup>130</sup> FM 23-20, 1940, 1.



pistol grips ... Pistol grips help stabilize the weapon during rapid fire and allow the shooter to *spray fire from the hip position*" (emphasis added).<sup>146</sup> Lowy restated this position at a Federalist Society conference at the National Press Club in 2019, claiming that "things like barrel shrouds [handguards] they enable [sic] you to hold the gun, *particularly in conjunction with the rear pistol grip* where you can spray an area and kill large amounts of people ..."<sup>147</sup>

Gun control advocates allege that pistol grips and handguards as they appear on AR-15 exist to enable the shooter to *spray fire from the hip*. Does this claim hold up?

### US Military Doctrine Does Not Support the Claim that Pistol Grips and Handguards are Intended to Facilitate Spray Firing from the Hip

AR-15 rifles are not military arms, irrespective of what features they share with military selective fire weapons. Nonetheless, because firearms prohibitionists insist upon conflating them with their selective fire look-alikes, US Army marksmanship doctrine provides a very useful benchmark against which to compare the prohibitionists' claim that pistol grips and handguards facilitate rapid firing "from the hip." But first, it will be helpful to clarify certain terms of reference. Those who advocate banning AR-15s use the term "barrel shroud" to describe "a shroud that is attached to, or partially or completely encircles, the barrel of a firearm so that the

<sup>146</sup> Report on Bill 17-843, "Firearms Registration Amendment Act of 2008" (District of Columbia Council Committee on Public Safety and the Judiciary, November 25<sup>th</sup>, 2008), 7.

<sup>147</sup> Jonathan Lowy, et al., *The Second Amendment in The New Supreme Court*, Panel 2: "Are Semiautomatic Rifles, aka 'Assault Weapons,' Protected by the Second Amendment?" (The Federalist Society, Civil Rights Practice Group, at the National Press Club, Washington, D.C., January 25<sup>th</sup>, 2019, 59:21 - 1:00:52). <https://fedsoc.org/conferences/the-2nd-amendment-in-the-new-supreme-court?agenda-item-panel-2-are-semiautomatic-rifles-aka-assault-weapons-protected-by-the-second-amendment>. Retrieved February 16<sup>th</sup>, 2019.

case")<sup>143</sup> and the Lewis Jennings Breach Loading Firearm, both patented in 1849.<sup>144</sup> Evolution was slow thereafter, with decades passing before repeating arms of any type superseded breach loaders in American service. But eventually the metal receiver, freeing the stock from double duty and leaving it to its sole duty of serving as a brace against the shoulder, opened the way for new design innovations including the modern pistol grip as we know it, positioned below the firing action in such a manner as to provide a more natural, comfortable, and effective grasp of the rifle. It is this purpose, and no other, for which the modern pistol grip is intended.

Given the innocuous purpose of the modern pistol grip, gun control advocates have resorted to attributing functions to it far beyond its actual use. Whether this has been an intentional propaganda effort or an honest mistake is unknown. What is clear is that gun control advocates have aggressively seized upon the modern pistol grip as the emblem and evidence of the iniquity they attribute to the AR-15 and similar rifles. The principal charge against modern pistol grips was succinctly stated by the District of Columbia Council's Committee on Public Safety and the Judiciary in their 2008, *Report on Bill 17-843, Firearms Registration Amendment Act of 2008*, asserting that so-called "[a]ssault weapons also have features such as

<sup>143</sup> Walter Hunt. US Patent No. 6,663, *Combined Piston-Breach and Firing-Cock*. 1849.

<sup>144</sup> August 21<sup>st</sup>, *Repeating-Gun*, <http://pdfpiw.uspto.gov/piw?PageNum=0&docid=00006663&IDKey=D3ED9E34B725&HomeUrl=http%3A%2F%2Fpatft.uspto.gov%2Fenclahum>. Retrieved February 16<sup>th</sup>, 2019.

<sup>145</sup> *Improvement in Breach Loading*. 1849.

<sup>146</sup> Lewis Jennings. US Patent No. 6,973, *Improvement in Breach Loading*. 1849.

<sup>147</sup> December 25<sup>th</sup>, *Firearms*, <http://pdfpiw.uspto.gov/piw?docid=00006973&SectionNum=4&IDKey=06FFA4B55622&HomeUrl=http://patft.uspto.gov/enclahum/PTO/patimg.htm>. Retrieved February 16<sup>th</sup>, 2019.

<sup>148</sup> For a brief overview of the development of lever action firearms including the evolution of the corporate entities that produced them, see Dr. James R. Lucie, *L'olcanic and Henry Firearms*, (The American Society of Arms Collectors, nd), [http://americansocietyofarmscollectors.org/wp-content/uploads/2013/03/B010\\_Lucie.pdf](http://americansocietyofarmscollectors.org/wp-content/uploads/2013/03/B010_Lucie.pdf), retrieved February 16<sup>th</sup>, 2019.



these pistol grips at first hand during a visit to another museum ship, USS North Carolina, BB 55, at Wilmington, North Carolina.

The chimera of handguards and modern pistol grips facilitating the spray of bullets indiscriminately from the hip has absolutely no basis in fact, either in the historical development of automatic, selective fire, and semiautomatic firearms technology, nor in the tactics, techniques and procedures for their employment.

### **“Barrel Shroud” Handguards**

Gun control advocates “no longer think[] we need to worry about bayonet mounts,”<sup>261</sup> which were dropped from the list of assault weapons features as set forth in the “Assault Weapons Ban of 2013.”<sup>262</sup> but the rebooted 2013 ban added the “barrel shroud”<sup>263</sup> The 2013;<sup>262</sup> but the rebooted 2013 ban added the “barrel shroud”<sup>263</sup> The handguard encircling the barrel—as a proscribed feature.<sup>263</sup> The purpose of these handguards is straightforward: it is “a covering that protects the shooter’s hand from the heat generated by firing a rifle.”<sup>264</sup> Gun control advocates of are at pains to associate this feature with mass shootings, as did Lowy when he said that that they are “useful because with the barrel shroud ... the guns heating up with this tremendous amount of fire ... your hand is protected and it is ... shielded from the heat,” that “they are put in for military

purposes ... to spray an area fire,” and that they “have no legitimate self-defense purpose.”<sup>265</sup>

This contention does not bear scrutiny. Like the semiautomatic firing mechanism itself, “barrel shroud” handguards are old technology. An early rifle so equipped was the Short Magazine Lee-Enfield (S.M.L.E.), “which first came into use around 1904,” and was equipped with “[a] new feature [which] was the complete covering of the barrel by the wooden stock, thus protecting the hands from the overheating barrel during rapid firing.”<sup>266, 267</sup> This “rapid firing” is not the sprayed fire envisioned by Mr. Lowy; British doctrine called for their soldiers to be able to fire fifteen rounds per minute<sup>268</sup>—much less than the maximum effective rate of fire for the AR-15 and comparable to its sustained rate of fire. It would appear that rates of fire less than fifteen rounds per minute also required this protective feature. The German Gewehr 1898, used by that power throughout World War I, had a “bolt action very awkward for rapid loading and firing, especially as compared to the S.M.L.E.”<sup>269</sup> Yet the Gewehr 98 was equipped, along with the forearm covering most of the underside of the barrel, and a handguard covering part of the upper side;<sup>270</sup> a subsequent iteration of this remarkable weapon—the Mauser 98K<sup>271</sup>—had a handguard and forearm encircling most of the barrel, as with the S.M.L.E.. Given that rifles have been equipped with “barrel shroud” handguards for more than 100 years and that the first rifles so equipped were bolt action, it is self-evident that like

<sup>265</sup> Lowy, Jonathan Lonn, et al., *The Second Amendment in The New Supreme Court, Panel 2: “Are Semiautomatic Rifles, aka ‘Assault Weapons,’ Protected by the Second Amendment?”* 59:21 – 1:00:52.

<sup>266</sup> Pridham, 16 – 17.

<sup>267</sup> For an illustration of an S.M.L.E., see Johnson, 96.

<sup>268</sup> Pridham, 67.

<sup>269</sup> *Id.* 20.

<sup>270</sup> Christopher Mace, “Gewehr 98 Mauser – The Cutting Edge Bolt Action,” *GunsAmerica Digest*, August 17<sup>th</sup>, 2018, <https://www.gunsamerica.com/digest/gewehr-98-mauser-the-cutting-edge-bolt-action/>. Retrieved March 17<sup>th</sup>, 2019.

<sup>271</sup> Johnson, 84.

<sup>261</sup> Sullum, 56 – 57.

<sup>262</sup> As well they might be: even the United States Army dropped bayonet training from the program of instruction for basic training in 2010; see

“One less skill for soldiers to master at boot camp: bayonet training” 2010

*Christian Science Monitor* online, 10 September

<http://www.csmonitor.com/USA/Military/2010/0928/One-less-skill-for-soldiers-to-master-at-boot-camp-bayonet-training>. Retrieved March 17<sup>th</sup>,

2019.

<sup>263</sup> S.150 — 113th Congress (2013-2014), Assault Weapons Ban of 2013.

<sup>264</sup> Sec. 2(a)(36)(A)(v), <https://www.congress.gov/bills/113/congress/senate/bills/150/text>, retrieved March 17<sup>th</sup>, 2019.

<sup>265</sup> Sullum, 57.

pistol grips, the employment of handguards that encircle the barrel has nothing to do with spraying fire from the hip, for while the six-armed *Gegenees* might have been able to fire bolt action rifles from the hip at Jason and the Argonauts,<sup>272</sup> no mere two armed mortal could hope to carry out such a feat of arms.

It takes a rate of fire much lower than the extravagant rates that gun control advocates ascribe to the AR-15 to heat a rifle barrel sufficiently to cause injury. Just how much less was shown in a 1975 Rock Island Arsenal study of external barrel temperatures at various points along the barrel's length for various rates and modes of fire.<sup>273</sup> While the study was conducted under "a product improvement program to improve the accuracy of the M16A1 Rifle's barrel,"<sup>274</sup> its findings are of interest for our purposes as well, as they show that rifle barrels can reach dangerous temperatures at low rates fire. For example, the study found that after firing 140 rounds at the rate of one round every 6 seconds (10 rounds per minute), external temperatures ranged from 265 to 585 degrees Fahrenheit at various points along the barrel.<sup>275</sup> Further, the study results show that external barrel temperatures at some points along the barrel reached temperatures of 200 degrees Fahrenheit (93.33 degrees Celsius) and higher *after the first shot fired*.<sup>276</sup> This is a critically important safety concern, as one study has shown that partial skin thickness burns occur after one second of contact at less than 70 degrees Celsius, and full skin thickness burns occur after one second of contact at around

<sup>272</sup> David Kravitz, *Who's Who in Greek and Roman Mythology* (Clarkson N. Potter, Inc., 1976), 105.

<sup>273</sup> Ronald E. Elbe, *External Barrel Temperature of the M16A1 Rifle* (GEN Thomas J. Rodman Laboratory, Rock Island Arsenal, distributed by the National Technical Information Service, US Department of Commerce) July 1975. <https://apps.dtic.mil/dtic/tr/fulltext/u2/a019649.pdf>. Retrieved March 17<sup>th</sup>, 2019.

<sup>274</sup> *Id.*, 1.

<sup>275</sup> *Id.*, Table II, page 10.

<sup>276</sup> *Id.*, Figures 4 – 10, pages 13 – 21.

95 degrees Celsius.<sup>277</sup> Another study found that damage to porcine skin in contact with a surface heated to just over 61 degrees Celsius (143.6 degrees Fahrenheit) occurred at only one second of contact.<sup>278</sup> In sum, "barrel shroud" type handguards exist to protect shooters from injury by contact with hot rifle barrels during ordinary, routine shooting activities, not just during extreme circumstances like combat.

Relating an experience from his military service, a childhood friend of mine once showed me the importance of the wrap-around handguard or "barrel shroud" to operating a firearm safely. He served in the infantry with the 82<sup>nd</sup> Airborne Division. He related to me his unit's experience with the M249 Squad Automatic Weapon (SAW), a light machine gun employed by the US Armed Forces. When first fielded, this weapon was equipped, not with a handguard, but with only a polymer forearm similar to the wooden one found on the BAR.<sup>279</sup> The top of the barrel was left exposed to the air for its entire length, in the manner that would, in effect, be required by law under Senator Feinstein's proposed Assault Weapons Ban of 2013 (this defect was later corrected). The result was soldiers burning themselves on the barrel. These burns would not have been incurred while firing from the hip in the manner imagined by gun control advocates. While the weapon can be fired that way, that is not its primary mode of employment. These injuries would have been sustained while operating the weapon in its usual manner—firing, reloading, repositioning the gun while shooting in the prone position, and moving from one firing location to another.<sup>280</sup> More such injuries

<sup>277</sup> J.C. Lawrence, and Bull, J.P., "Thermal conditions which cause skin burns," *Institution of Mechanical Engineers, Engineering in Medicine*, Volume 5 Issue 3, July 1976, 61.

<sup>278</sup> A.R. Moritz and Henriquez, F.C., "Studies of thermal injury," *American Journal of Pathology*, 23(5), September 1947, 711.

<sup>279</sup> For an image of what the M249 SAW looked like in its original configuration, see *SH 21-25, The Infantryman's Handbook* (United States Army Infantry School, March 1985), 44.

<sup>280</sup> The Army ultimately corrected this, adding a handguard on top of the barrel and forearm, thus completely encircling the barrel. See *FM 23-14*,



you, meaning how comfortable the gun feels to you and how accurate you can shoot it. With the correct length of pull, you will have quick sight acquisition, better control, better accuracy, and feel more comfortable.<sup>328</sup>

And further,

[m]ost rifles are designed for the average adult male, but many people, especially women, are not built like your average adult male. You will find that many rifles will not feel comfortable when you shoulder them. This is because the length of pull ... is either too long or too short for you.<sup>329</sup>

Most people cannot afford to have a rifle custom-stocked to fit their precise size and shape and certainly cannot afford to have custom stocks made for each member of their family. Collapsible or adjustable stocks provide a standard, off-the-shelf solution that allows each shooter to adjust the rifle to their own body and thus optimize their shooting experience; adjustable buttstocks enable multiple members of a family to practice shooting with the same rifle, optimizing the shooting experience for each. In this respect, adjustable buttstocks reflect the American shooting tradition, wherein hunting, target shooting, and arms for self-defense have always been the province of ordinary working people of modest means, as opposed to the European tradition wherein the shooting sports were the domain of the wealthy and privileged classes who could afford to indulge in fine, handcrafted, and extremely expensive custom

<sup>328</sup> Suzanne Wiley, "What is Length of Pull and why does it Matter?" *The Shooter's Log*, July 10<sup>th</sup>, 2013, <https://blog.cheaperthandirt.com/length-pull-matter/>. Retrieved March 24<sup>th</sup>, 2019.

<sup>329</sup> "Purchasing a Women's Rifle and What to Consider." *Legacy Sports International*, May 10<sup>th</sup>, 2017, <https://www.legacysports.com/purchasing-a-womens-rifle-and-what-to-consider/>. Retrieved March 24<sup>th</sup>, 2019.

sized 9mm semiautomatic pistol as for an AK-series rifle in a similar amount of space. Even considering the ten round magazines required in some jurisdictions, the potential number of shots would be forty rounds for the pistols compared to 30 rounds for the AK—a premium of one-third. Furthermore, in addition to the benefit of being able to carry more rounds of ammunition, a mass shooter equipped with a semiautomatic pistol rather than a long gun will also find his ammunition, being housed in smaller feeding devices, easier to carry, stow, and hide than the "high capacity" semiautomatic rifle magazines so decried by firearms prohibitionists.

Those most adversely affected by magazine capacity restrictions are law abiding citizens wishing to use their firearms for lawful purposes, especially those forced to rely upon their firearms for self-defense. Such restrictions will pose little if any effective constraint upon those who are intent upon misusing firearms.

### Collapsible and Folding Stocks

Gun control advocates also worry about adjustable and folding buttstocks that they fear make so-called "assault" weapons "lighter and more concealable than standard long guns,"<sup>326</sup> which in their view can only serve nefarious purposes in the hands of civilians. In fact, they serve legitimate, non-military purposes: to adjust the length of pull of the rifle to the size, stature, clothing and equipment of the shooter; to facilitate easier transportation and stowage of the firearm; or both.

"Length of Pull is the distance from the center of the trigger to the center of the buttplate,"<sup>327</sup> and is

one of the most important aspects of a gun's dimensions and determines whether the gun will fit

<sup>326</sup> Sugarman, <http://www.vpc.org/studies/avaintro.htm>. Retrieved July

8<sup>th</sup>, 2019.

<sup>327</sup> Steindler, 244.



sporting arms. Adjustable buttstocks are more functional than even this, however:

The requirements for perfection of length of pull will change if the rifle is to be used in more than one position. Perhaps this is what confounds the rifle shooter who is able to use different positions. Unlike a trap or skeet shooter, or maybe someone on Safari, the one 'perfect' fit may not exist.<sup>330</sup>

Folding buttstocks serve one principal function: to make the rifle easier to transport or stow, and there are perfectly straightforward, non-criminal reasons as to why a folding stock is useful and appropriate on a civilian firearm. Some people occupy small living quarters, where storage is at a premium. Some drive smaller vehicles with less cargo capacity. Some may wish to carry their rifle to the range in a smaller, possibly less expensive, rifle case. In fact, the military application of folding stocks shows that they do not exist for the nefarious purpose of secreting rifles into vulnerable places in which to unleash mass violence. The default firing position in military doctrine is from the shoulder. Well-trained soldiers do not run around the battlefield employing their rifles in some *faux* gangland style, firing them from the hip with the stocks collapsed. Folding stocks exist in military service to facilitate handling the rifle in cumbersome and awkward situations such as parachuting and boarding or disembarking vehicles. The ability to reduce the size of the rifle by folding or otherwise collapsing the stock is a simple matter of convenience, not of lethality or tactical surprise, and this convenience is of equal utility in civil as well as military life. Consider the ArmaLite AR-7 Explorer survival rifle: introduced in 1959, the AR-7 is a semiautomatic .22 caliber rifle with what might be the ultimate collapsible stock: the entire rifle disassembles and can be

<sup>330</sup> "Rifle Fit: Length of Pull." *Art of the Rifle*, February 27<sup>th</sup>, 2012. <https://artoftherifle.com/rifle-fit-length-of-pull/2012/02/rifle-fit-length-of-pull.html>. Retrieved March 24<sup>th</sup>, 2019.

stowed inside the buttstock itself, which floats.<sup>331</sup> The purpose of this arrangement is straightforward: to allow the rifle to be stowed in as small a space as possible. This is better illustrated by the version formerly employed by the Israeli Armed Forces. Instead of a floating buttstock that served as a storage case for the rest of the rifle, this version came equipped with a collapsible wire buttstock. Although adopted by a military force, this rifle was not a combat weapon—it was a survival rifle issued to Israeli pilots. The function of the collapsible wire stock was not so much to facilitate the downed pilot's secreting the rifle in his clothing or baggage as he escaped and evaded as it was to make it easier to stow in his aircraft. "[T]he rifles were intended as a survival weapon, to forage for food in the event of a crash in a remote area, the task for which the AR-7 was originally designed;" the collapsible stock was added to best use "little spare room in the cockpit of a modern fighter jet."<sup>332</sup>

Adjustable and folding buttstocks exist, not for criminal purposes, but for legitimate civilian and military shooting applications. But is there any merit to the contention that these features render the rifles more easily concealed and therefore more deadly in the hands of killers? *In a word, no*. To start with, a rifle with a collapsible or folding stock might or might not be materially lighter than its fixed stock counterpart. The fixed stock M16A2 rifle weighs 7.78 pounds without sling or magazine.<sup>333</sup> At 6.49 pounds, the M4 Carbine weighs just 1.29 pounds less, but is actually slightly heavier than the fixed stock M16A1.<sup>334</sup> The fixed stock Soviet Kalashnikov AKM (*Автомат Калашникова модернизированный*, or Automatic Kalashnikov Rifle, Modernized in English) with an empty Bakelite

<sup>331</sup> Jeremiah Knupp, "The Unlikely Resilience of the AR-7 Survival Rifle," *American Rifleman*, December 27<sup>th</sup>, 2016. <https://www.americanrifleman.org/articles/2016/12/27/the-unlikely-resilience-of-the-ar-7-survival-rifle/>. Retrieved January 1st, 2021.

<sup>332</sup> *Id.*

<sup>333</sup> FM 23.9, July 1989, 2-2.

<sup>334</sup> TM 9-1005-249-10, *Operator's Manual for Rifle, 5.56-MM, M16 (1005-00-856-6885); Rifle, 5.56-MM, M16A1 (1005-00-073-9421)* (Headquarters, Department of the Army, February 1985), 1-4.



the time and previously. Both features were influenced by preexisting civilian firearms developments.

The development of the AR-15 was set in train when the president of Fairchild Engine and Aircraft Corporation, "avid hunter and gun aficionado" Richard Boutelle, decided to diversify the company by chartering its ArmaLite Division to "develop a line of fine, truly lightweight weapons [using] [m]aterials being used in the aircraft industry [which] were thought to be able to be used in weapons."<sup>378</sup> Although "they deferred commercial work and directed their activities toward military firearms" following the success of their earlier AR-5 survival rifle, ArmaLite's initial plan was "to produce fine sporting arms for the commercial market" under the supervision of the Division's chief engineer, the legendary Eugene Stoner.<sup>379</sup>

The other feature which made the AR-15 / M16 remarkable was the round it fired—the 5.56mm cartridge, very similar to the .223 cartridge commonly used in the AR-15. The adoption of this round was groundbreaking in that it was the first time the United States had adopted an intermediate cartridge—that is, a cartridge larger than a pistol cartridge but smaller than a traditional military rifle cartridge like the .303 Enfield or the 30.06.<sup>380</sup> A constituency had long advocated for the adoption of an intermediate cartridge by the US Army: "[s]ince the introduction of firearms into military service, there

<sup>378</sup> David R. Hughes. *The History and Development of the M16 Rifle and its Cartridge* (Armory Publications 1990), 254.

<sup>379</sup> *Id.*, 24.

<sup>380</sup> The United States was not the first nation to adopt an intermediate cartridge. Nazi Germany had previously adopted the STG-44 assault rifle, chambered in 7.92mm Kurtz (see Mark Keefe, "Shooting the Sturmgewehr," *American Rifleman*, October 29<sup>th</sup>, 2014, <https://www.americanrifleman.org/articles/2014/10/29/shooting-the-sturmgewehr/>. Retrieved July 10<sup>th</sup>, 2019); and the Soviet Union had long since adopted the M43 7.62x39mm round, which remains one of the most widely used calibers (see "7.62x39 (M43)," *Terminal Ballistics Research*, <https://www.ballisticsresearch.com/Knowledgebase/7.62x39-M43.html>. Retrieved July 10<sup>th</sup>, 2019).

have been attempts to reduce the size or caliber of bullets used in soldiers' rifles."<sup>381</sup> "Adoption of a small caliber rifle as a standard service weapon [was] not a recent requirement,"<sup>382</sup> but "the first written requirement for a small caliber weapon ... began in 1957."<sup>383</sup>

Developing a rifle that would fire an intermediate caliber round was a longstanding interest in some military circles, but the cartridge itself that would become the 5.56mm and .223 Remington rounds was inspired by existing civilian technology:

The impetus for creating the .223 Remington cartridge came from previous development work at Aberdeen Proving Ground ... However, the .223 cartridge started as the .222 Remington Cartridge, developed particularly for varmint shooters in 1950 by Mike Walker of Remington.<sup>384</sup>

Thus, by dint of the history of its development and of the cartridge it fires the AR-15—as distinguished from the selective fire M16—is not a military weapon. None of its features are exclusively military in character, and those of its features that were most groundbreaking at the time of its development owed their existence, not to the dictates of military procurement officers, but to the innovation of civilian firearms enthusiasts and engineers. The AR-15 is not a "weapon of war." What it is, rather, is a highly versatile general-purpose rifle well suited to most civilian shooting applications, including target shooting, hunting, competition shooting, and defense of the home. Given its history, its uniquely American background, and its kinship with the M16—America's iconic service rifle of the Vietnam era and beyond—the AR-15 is a

<sup>381</sup> Hughes, 376, Introduction, first page (not paginated).  
<sup>382</sup> FM 23-9, June 1974, 175.

<sup>383</sup> *Id.*

<sup>384</sup> Hughes, 23.



particularly well suited to facilitating Americans' "learning to handle and use [arms] in a way that makes those who keep them ready for their efficient [militia] use."<sup>399</sup> The AR-15 rifle is not a military weapon. But given that its layout and configuration are similar to America's current service rifle, it is eminently suited to the purpose of the Second Amendment as set forth by Judge Cooley. This view was reinforced by the United States Supreme Court's prior holding in *United States v. Miller*,<sup>400</sup> as procedurally problematic as that case was.<sup>401</sup> In *Miller*, Frank Layton and Jack Miller had been charged with possessing an unregistered short-barreled shotgun in violation of the National Firearms Act. The District Court had "sustained [a] demurrer and quashed the indictment" against Miller and Layton as violating the Second Amendment.<sup>402</sup> The Supreme Court reversed, holding that

Remington. The two rounds are visually identical on casual inspection and very similar in characteristics, and they are often spoken of as if they are interchangeable. They are not, however, identical. Any rifle chambered in the military 5.56mm round can safely fire the .223 Remington round. The reverse is not necessarily true, however. Due to slight differences in the external dimensions of the case, firing a 5.56mm NATO round from a rifle chambered in .223 Remington produces higher than optimal pressures in the chamber, which can produce problems if a 5.56mm round is fired from a rifle chambered in .223 Remington. For concise review of this issue, see *"223 vs. 5.56: FACTS and MYTHS,"* Gavintube / Ultimate Reloader, <https://www.youtube.com/watch?v=VCS4fNFmCvA>. Retrieved January 21<sup>st</sup>, 2021.

<sup>399</sup> Cooley, 396.

<sup>400</sup> *United States v. Miller*, 307 US 174 (1939).

<sup>401</sup> "As for the 'hundreds of judges' .... who have relied on the view of the Second Amendment Justice STEVENS claims we endorsed in *Miller*: If so, they overruled *Miller*. And their erroneous reliance upon an *uncontested and actually unreasoned case* cannot nullify the reliance of millions of Americans (as our historical analysis has shown) upon the true meaning of the right to keep and bear arms" (emphasis added). *District of Columbia v. Heller*, 554 US 570 (2008).

<sup>402</sup> *Id.*

It might be supposed from the phraseology of this provision that the right to keep and bear arms was only guaranteed to the militia; but this would be an interpretation not warranted by the intent. The militia, as has been explained, consists of those persons who, under the law, are liable to the performance of military duty, and are officered and enrolled for service when called upon. But the law may make provision for the enrolment of all who are fit to perform military duty, or of a small number only, or it may wholly omit to make any provision at all; and if the right were limited to those enrolled, the purpose of the guarantee might be defeated altogether by the action or neglect to act of the government it was meant to hold in check. The meaning of the provision undoubtedly is, that the people, from whom the militia must be taken, shall have the right to keep and bear arms; and they need no permission or regulation of law for that purpose. But this enables the government to have a well regulated militia; for to bear arms implies something more than the mere keeping; it implies the learning to handle and use them in a way that makes those who keep them ready for their efficient use; in other words, it implies the right to meet for voluntary discipline in arms, observing in doing so the laws of public order.<sup>397</sup> (emphasis added).

No aspect of the semiautomatic AR-15's capabilities of features render it any more a military arm or "weapon of war"—or any "deadlier"—than any other semiautomatic rifle. However, as a counterpart to the selective fire (and thereby indubitably military) M16, the AR-15 is very well suited to militia use. Having similar (though not necessarily identical)<sup>398</sup> ammunition,

<sup>397</sup> Thomas M. Cooley. *The General Principles of Constitutional Law in the United States of America* (Little, Brown, and Company, 1880), 271.

<sup>398</sup> The M16 family of rifles is chambered in the NATO-standard 5.56mm round. Many (but not all) AR-15s are chambered in the civilian .223

the trigger. AR-15s are not capable of automatic fire and are not "weapons of war" in the modern sense.<sup>445</sup>

### The Basic Aim of Infantry Combat: Fire Superiority

"Crime" as usually understood and "combat" are fundamentally different phenomena. While both are carried out by those who seek to impose their will upon others by violence, the two phenomena operate upon entirely different assumptions. The criminal seeks out a victim that is unarmed, unwarned, and unable to offer meaningful resistance; confronted with complicating factors, the criminal is likely to break off his attack and seek another target. Even those most unusual of criminals, the gangland killers and Mafioso that engage in "wars" with their rivals, will not strike their foes on equal terms, but will resort to surprise or subterfuge to strike their enemy at a time and in a manner when the target is more or less helpless. In combat, by contrast, the soldier can never assume that his enemy is helpless. The soldier must presume that his enemy can and will offer meaningful resistance, and must proceed accordingly. Granted, the sophisticated practitioner of maneuver warfare may seek to avoid direct confrontation by "preempt[ing] the enemy, that is, [by] disarm[ing] or neutraliz[ing] him before the fight," and if he cannot do that, he may "seek[] to dislocate enemy forces, i.e., removing the enemy from the decisive point, thus rendering them useless and irrelevant to the fight."<sup>446</sup> But the soldier cannot always avoid the bloody confrontation. For the infantry, the day of

<sup>445</sup> Of course, bayonet lugs and grenade launchers are military features as well. That the former are of trivial importance to the issue of crime is self-evident. As for the latter, they are useless without the grenades to launch, which are not available to the public and largely obsolete even in military service, so that the chances of any crimes being perpetrated using rifle grenades is vanishingly small; I doubt that such has ever occurred in the United States.

<sup>446</sup> Robert R. Leonhard, *The Art of Maneuver: Maneuver-Warfare Theory and Actual Battle* (Presidio Press, 1994), 19–21.

### The One Uniquely Military Firearms Technology: Automatic Fire

As the *Kolbe* dissent noted, "*Heller* in no way suggests that the military usefulness of a weapon disqualifies it from Second Amendment protection."<sup>443</sup> As noted above, for most of history there has been no meaningful distinction between "military" and "civilian" firearms technology, except in that military firearms technology often lagged behind civilian arms, and armies often relied upon civilian firearms designers and users for the improvements to firearms that they did adopt. As the *Kolbe* dissent noted,

at the time of the Second Amendment's ratification, it was understood that all citizens capable of military service ... would bring the sorts of lawful weapons that they possessed at home to militia duty ... Ordinarily when called for militia service able-bodied men were expected to appear bearing arms supplied by themselves and of the kind in common use at the time.<sup>444</sup>

Nonetheless, the *Kolbe* majority and many other firearms prohibitionists insist on depicting the AR-15 rifle as a "weapon of war" and calling for banning it on that basis. At the end of the 19<sup>th</sup> Century and the beginning of the 20<sup>th</sup>, a new technology emerged that would set out a clear line of demarcation between firearms adapted solely to military applications and those useful in other shooting applications—technology that would, for the first time, clearly set apart "weapons of war" from other firearms. That technology was automatic fire: the ability to fire more than one round, whether in a continuous stream or in a burst, with each pull of

<sup>443</sup> *Kolbe* (dissent).

<sup>444</sup> *Id.*



A dilemma, for purposes of infantry combat, is

a situation in which the enemy is presented with two or more equally bad alternatives. A problem is a situation in which the enemy is presented with only one bad alternative. Creative combinations allow the leader to create a dilemma for the enemy. When presented with a dilemma, an enemy has two reactions. The first reaction is not knowing what to do as he attempts to decide between equally bad options. This effect is commonly termed "fixed." When the enemy is fixed, the leader benefits from freedom of action. The second reaction is to simply choose one of the two equally bad options. Because the enemy's choice is an option in which the friendly force has the upper hand, the leader is able to exploit the enemy's decision.<sup>450</sup>

A military unit has achieved fire superiority "if its fires are effective enough to prevent the enemy from returning effective fire of its own."<sup>451</sup> Fire superiority effectuates this

by fixing the enemy and suppressing the enemy [that is, by] preventing him from withdrawing, repositioning, or counterattacking. We suppress the enemy by showering fire superiority over him — that is by showering him with such a high volume of effective fire that we thwart his efforts to reply with effective fire of his own. By fixing and suppressing the enemy, we allow our own maneuvering element to accomplish its task relatively unmolested. The support element achieves these effects — fixing and

<sup>450</sup> FM 3-21.8 (FM 7-8), *The Infantry Rifle Platoon and Squad* (Headquarters, Department of the Army, March 2007), paragraph 1-103.

<sup>451</sup> Dennis P. Chapman, "An Element of Strength: Reinvigorating Small Unit Training," *Armor*, May-June 2004, 35 – 39.

reckoning always awaits when they must cross that last hundred yards and "close with the enemy by means of fire and maneuver to defeat or capture him, or to repel his assault by fire, close combat, and counterattack."<sup>447</sup>

In the aftermath of the First World War, British military strategist J.F.C. Fuller "came to believe that no attack in modern war would succeed against an enemy in position unless his resisting power either through surprise or preponderating fire"<sup>448</sup> was reduced. We shall address surprise later. As to achieving "preponderating fire" in the infantry attack, automatic fire—burst or continuous—is the key. To pierce the enemy's defenses and destroy his forces, and conversely, to break an attacking enemy's momentum and prevent him from compromising one's own defenses, an infantry unit must gain *fire superiority*, and it is on this task that automatic weapons—whether full auto or burst—are decisive. In the attack,

the assaulting force is supported by the support by fire (SBF) element. The SBF element's focus is to gain fire superiority and cover the maneuver of the assaulting force as it gains a foothold onto an objective. Establishing the SBF is as critical to the deliberate attack as conducting the assault. Without the SBF, the assaulting element has to contend with an enemy that is presented with only one problem. When the assault element is covered by the SBF element, the enemy is now presented with a dilemma.<sup>449</sup>

<sup>447</sup> FM 7-8, *Infantry Rifle Platoon and Squad* (Department of the Army, 22 April 1992), paragraph 1-1.

<sup>448</sup> English, 38.

<sup>449</sup> SFC Carter H. Conrad and SFC Johnny Tinsley, "The Art of Support by Fire," *Infantry* Online, <https://www.benning.army.mil/infantry/magazine/issues/2014/Apr-Jun/ConradTinsley.html>, Retrieved April 23<sup>rd</sup>, 2019.

suppressing — in two ways: by inflicting casualties (physical impact), and by convincing enemy soldiers that if they leave their cover to fire or move, they will become casualties (psychological impact).<sup>452</sup>

Automatic fire achieves suppression in part psychologically. Douglas Southall Freeman quaintly illustrates this in his biography of Robert E. Lee: “[I]n one of his brushes in thick woods, [Brigadier General Henry A.] Wise ordered an artilleryist to open fire. The officer protested that he could not see the enemy and could do no execution. ‘Damn the execution, sir,’ Wise was reported to have said, ‘it’s the noise that we want.’”<sup>453</sup> Another example comes to us from General Vasily Chuikov, who reportedly sought to paralyze his German opponents at Stalingrad “by trying to make every German soldier feel that he is under the muzzle of Russian gun.”<sup>454</sup> As this author has observed elsewhere,

[w]hether burst or full auto, selective fire serves one function in combat—to gain fire superiority over an enemy force. Fire superiority is achieved when the enemy has been suppressed—which is to say, when one side is placing such a high volume of fire into the enemy’s general vicinity that the enemy is forced to seek cover and is thereby prevented from returning effective fire.<sup>455</sup>

Thus, it isn’t necessarily the casualty producing effect that gives fully automatic fire its greatest combat value, but its impact on behavior—that is, the effect of impelling the enemy to hide rather

<sup>452</sup> Dennis P. Chapman, “Tactical Errors in the Dismounted Fight,” *Annals of the Army of the Republic of China*, 20–23.

<sup>453</sup> Douglas Southall Freeman, *Robert E. Lee – A Biography* (Charlottesville: Scribner’s Sons, 1934), Volume 1, 591, note 11, quoting Walter Harnett

Taylor, *Four Years with General Lee*, 34.

<sup>454</sup> English, 223.

<sup>455</sup> Chapman, “The Weapons of War Myth.”

than return well-aimed fire, thus degrading his combat effectiveness. To achieve this psychological effect, however, it is not enough that suppressive fire merely be noisily delivered in high volume. It must be delivered with sufficient accuracy to create a real threat of death to enemy occupying or attempting to traverse the “beaten zone”—the cigar-shaped<sup>456</sup> “... Cone of Misses,” or as it is known today, the deadly beaten zone of falling shot.<sup>457</sup> To the extent that this suppressive fire actually does kill or wound enemy soldiers ensconced in or trying to cross the beaten zone, so much the better. Given their relatively unwieldy physical configuration, fire control, target acquisition, and target engagement by machineguns (except in hasty contacts) is a rather systematic affair often accomplished with the weapon mounted on a tripod and aided by the use of a traversing and elevating mechanism (commonly known as the T&E).<sup>458</sup> Targets are engaged by increasing the size of the beaten zone by traversing the barrel to the left or right (traversing fire), and by increasing and decreasing the elevation of the barrel (searching fire).<sup>459</sup> On the defense, machineguns employ grazing fire as a defensive barrier to break the momentum of attacking forces and prevent penetration of the defensive position—grazing fire being “fire which is approximately parallel to the ground which does not rise above the height of a man,”<sup>460</sup> or in more contemporary usage, more than one meter above the ground.<sup>461</sup>

The majority in *Kolbe* glosses over the major difference between an AR-15 and M16 – selective fire capability – thus:

<sup>456</sup> *Training Regulation 240-10, Machine Gun. Technique of Machine-gun Fire, Direct Loading* (War Department, December 19<sup>th</sup>, 1923), 3.

<sup>457</sup> English, 2.

<sup>458</sup> TR 240-10, 6; FM 23-67, *Machinegun*, 7.62-MM, M60 (Headquarters, Department of the Army, 29 February 1984), 3-2 – 3-7.

<sup>459</sup> TR 240-10, 6 – 7; FM 23-67, *Machinegun*, 7.62-MM, M60 (Headquarters, Department of the Army, 29 February 1984), 7-4, 9-7; FM 23-14, M249 *Light Machine Gun in the Automatic Role* (Headquarters, Department of the Army, 26 January 1994), 6-5.

<sup>460</sup> TR 240-30, 8.

<sup>461</sup> FM 23-14, 6-3 and FM 23-67, 7-3 and 8-6; see also FM 23-14, 6-15.



in the next room. Assault rifles are also poor hunting weapons due to low accuracy beyond 100 yards.<sup>486</sup>

Nearly everything Dr. Winslow wrote in this passage is wrong, starting with his very first assertion – that such rifles are “challenging for untrained civilians to control.” The opposite is true. An AR-15 firing .223 or 5.56mm ammunition produces *zero* felt recoil – that is, nearly all the recoil produced by firing is absorbed by the buffer assembly, transmitting almost none to the shooter’s shoulder. Nor is there in any appreciable tendency for the muzzle to rise as is plainly noticeable when firing any handgun. In fact, the AR-15 rifle is extremely easy to use and is really the perfect rifle for a beginning shooter to learn with. Adding an adjustable stock makes an AR-15 even more suitable for women or others of slight stature. Just how easy the AR-15 is to control when firing was clearly demonstrated in a 48-second video posted to YouTube in 2016. In this video, made in response to a claim by *New York Daily News* writer Gersh Kuntzman that when shooting an AR-15 “[t]he recoil bruised [his] shoulder ... [and] the explosions [the rounds being fired] — loud like a bomb — [ave him] a temporary form of PTSD,”<sup>487</sup> Christopher Waller grasps an AR-15 by the pistol grip and, holding it with that one hand, places the buttstock against his nose, and proceeds to fire several shots from that position. Mr. Waller then faces the camera, stating that his nose is “not broken, not bleeding, not bruised.”<sup>488</sup> I would not recommend repeating this experiment, but it does give the lie to Winslow’s claim that AR-15s are difficult to control. Another remarkable illustration is

Gerish Kuntzman. "What is it like to fire an AR-15? It's horrifying, menacing and very very loud." *New York Daily News*, July 14<sup>th</sup>, 2016. <https://www.nydailynews.com/news/crime/firing-ar-15-horrifying-dangerous-loud-article-1.2673201>. Retrieved May 4<sup>th</sup>, 2019.

<https://doi.org/10.1002/ajoc.12673>. Retrieved May 4<sup>th</sup>, 2019.

Christopher Waller. "AR-15 Recoil Rebuttal." YouTube, June 17th, 2016. <https://www.youtube.com/watch?v=8T3qipZB6ME>, retrieved May 4th, 2019.

127

because it is the most versatile rifle ever made. Every day, thousands of Americans throughout the United States use it for target shooting, competition shooting, hunting, collecting, and self-defense.

## Is the AR-15 Fit for Civilian Shooting Applications?

Applications.

Gun control advocates often assert that AR-15s are not suitable for civilian shooting applications and that civilians are not fit to own them. One good example of this line of reasoning is provided by Dr. Dean Winslow of Stanford University. Dr. Winslow is a retired US Air Force colonel who had been nominated by President Trump to serve as Assistant Secretary of Defense for Health Affairs. At his confirmation hearing, Senator Jeanne Shaheen pressed him about the military discharge of a then-recent mass shooter. In response, Dr. Winslow blurted out that "I'd also like to... just say how insane it is that in the United States of America a civilian can go out and buy a semiautomatic weapon like an AR-15." Not surprisingly, his nomination was put on hold by the administration and subsequently withdrawn. Winslow then published an opinion piece in the *Washington Post*, in which he argued that

because of their high muzzle velocities, assault weapons are challenging for untrained civilians to control and are not optimal for home defense. A pump action 12-gauge shotgun, with its excellent stopping power, would be far better. Even with imperfect aim, a shotgun will hit its target, while the pellets won't go through a wall to endanger someone

pencils were 3 \_\_\_\_\_ Y Winslow. "I spoke my mind on guns. Then my Senate

Dean L. Winslow. I spoke in the *Washington Post*, December 19, 1905. I was bold "The mind-on-trust."

confirmation was put on hold. [theintelligencer.com/opinions/i-spoke-my-mind-on](http://theintelligencer.com/opinions/i-spoke-my-mind-on)

<https://www.washingtonpost.com/archive/local/2017/08/02/department-in-the-trump/>

torpedoed-my-appointment-in-the-  
torpedoed-my-appointment-in-the-  
12017/12/20/8f708f6c-c50d-11e7-833f-  
Retrieved  
May

administration/2017/12/20/0109224-story.html?utm\_term=.e104765368fb.

155031558ff4\_story.html?unit=58

126

# EXHIBIT 83



## The .223 Family Tree

By Richard A. Mann - June 3, 2022



### The .223 Remington cartridge and its AR-compatible offspring.

The M16/AR15 was originally chambered for the .223 Remington (1962), and since then that cartridge has become the patriarch of several very useful cartridges that are also AR-15 compatible.

Metallic rifle cartridges come in families. In the .30-06 family, you have the .270 Winchester and .280 Remington. In the .308 Winchester family, you have the .243 Winchester and 7mm-08 Remington. Though the .223 Remington now has its own family, it was based on the .222 Remington (1950), which was a proprietary cartridge, meaning it wasn't based on another SAAMI-approved cartridge.



*As the original cartridge of the AR-15, the .223 Remington, is now the father of several other cartridges that can do things the .223 cannot—while still being AR-15 compatible.*

If you want an AR-15 that's multi-cartridge compatible, it makes sense to choose cartridges from the same family. This will allow a conversion with nothing but a barrel or barreled upper receiver. Since the cartridges all come from the same family, you won't need to replace the bolt carrier or bolt, because the rim diameter for all the cartridges is the same.

With an AR-15 chambered for the .223 Remington, you can do this and run five other cartridges. Here's a look at the .223 Remington, and the family of AR-15-compatible cartridges it has fathered.



*For those who might like to have multiple uppers for the same AR-15 lower, Wilson Combat now offers a 30-round magazine that's compatible with the .223 Remington, the .300 Blackout and the .300 HAMR.*

### **.223 Remington (1962)**

The development of the .223 Remington is intrinsically linked to the M16, which is the full-auto version of the civilian rifle now known as the AR-15, or in more politically correct circles, as the MSR (modern sporting rifle). The military would ultimately replace the .223 Remington with its twin, the 5.56 NATO, but that didn't have any impact on the cartridge's popularity. Since its introduction, it has become very popular for competition, hunting and self-defense.



*The .223 Remington was the original cartridge of the AR-15. Even though it has spawned several excellent offspring, it remains the most popular chambering for the platform.*

Though many will argue it doesn't suffice for deer or any type of big-game hunting, it is, in fact, legal for that pursuit in more states than not. And as far as factory ammunition goes, you'll only find more options for the .308 Winchester. Most importantly, the .223 Remington has served as the basis for five other cartridges that have all become viable options in the AR-15.





*Next to overall length, rim size is critical when it comes to AR-15 compatibility. With the same 0.378-inch rim diameter, an AR-15 can be easily converted to any of these cartridges.*

### 5.56 NATO (1980)

Maybe the best way to describe the 5.56 NATO, which was created to deliver better reliability and performance for military use in the M16, is to say it's the better-performing identical twin. It's the twin that ultimately became the career soldier of the family. From an external dimension standpoint, the .223 Remington and the 5.56 are identical. The real differences involve maximum average pressure (MAP) and how the chamber is cut into the barrel.



*The 5.56 NATO is a dimensional twin to the .223 Remington, but the cartridges aren't 100-percent interchangeable.*

Regarding pressure, 5.56 NATO ammunition is loaded to a MAP of about 58,000 psi. The .223 Remington is loaded to a MAP of 55,000 psi. The throat of the chamber for the 5.56 NATO is also cut 0.125-inch longer. Because of these differences, if you fire a 5.56 NATO cartridge in a rifle chambered for the .223 Remington, pressures can spike to as high as 65,000 psi. This isn't safe and can cause primers to back out—or even a catastrophic firearm failure. On the other hand, it's safe to fire .223 Remington ammunition in a rifle chambered for the 5.56 NATO. Reliability and accuracy might not be optimal, but it's safe.

Interestingly, the 5.56 NATO isn't a SAAMI-approved cartridge. However, most of today's AR-15 rifles are chambered for it as opposed to the .223 Remington to allow for maximum ammunition compatibility.

*By staying in the family, you can swap upper receivers and shoot different cartridges without having to change out the bolt in your rifle.*

### **.204 Ruger (2004)**

Most families have that one member who never seemed to grow up. They're cute, smart and good at their job, but they just never were all that popular. That's the case with the .204 Ruger. Though the .222 Remington Magnum is credited as the parent case for the .204 Ruger, the .222 Remington Magnum is like the older and bigger brother to the .223 Remington. However, like the .222 Remington, the .222 Remington Magnum has, for the most part, fell into obscurity. Though not originally thought of as a cartridge for the AR-15, given it's .223 Remington-sized 0.378 rim diameter and less than 2.26-inch overall length, it'll work well in MSRs.

*The .204 Ruger is the fastest AR-15 compatible offspring of the .223 Remington and is ideal for vermin and predator hunting.*

With its ability to push a 32-grain bullet faster than 4,000 fps, the .204 Ruger is the fastest-shooting cartridge within the .223 Remington family. With that speed and explosive results on small vermin, it's a favorite for shooting prairie dogs, fox, bobcats and coyotes. Ammunition is available from most of the major manufacturers, but with only about 20 factory loads, bullet choices are limited.

### **.300 Blackout (2011)**

If there's a cool kid in the .223 Remington family, it's the .300 Blackout. The cartridge was developed by Advanced Armament Corporation (AAC) to provide intermediate ballistics like the 7.62×39 Russian cartridge, while also performing very well as a subsonic cartridge. Though AAC, in conjunction with Remington, get credit for the cartridge's development, it actually began life as a wildcat developed by J.D. Jones and was known as the .300 Whisper.



*The .300 Blackout is really two cartridges in one. On one hand, it's the best subsonic cartridge for the AR-15, and on the other, it'll suffice for smallish, big-game hunting and limited tactical application.*

Jones shortened the .223 Remington case and necked it to fit a .30-caliber bullet. AAC and Remington took Jones' creation, refined the concept and submitted it to SAAMI for approval. The rest is history; next to the .223 Remington/5.56 NATO, the .300 Blackout is the most popular chambering in the AR-15 platform.

*If subsonic shooting is what you desire, the .300 Blackout is the best cartridge for the AR-15.*

Smart marketing and a cool name get some of the credit for the Blackout's success. The rest of its success is attributed to the availability of factory subsonic and supersonic ammunition. Shooters could go quiet with subsonic ammo and a suppressor, or tackle deer and feral hogs with supersonic loads. Though early subsonic blackout loads delivered dismal terminal performance, today there are several expanding subsonic offerings. However, it's rare an AR-15 will shoot both subsonic and supersonic loads with great precision. There have also been instances where a .300 Blackout cartridge was chambered in a .223 Remington. This generally results in the permanent disassembly of the rifle and sometimes an injured shooter.

*For AR-15 compatibility, cartridge overall length is critical and must be around 2.26 inches or less to work in magazines.*

### **.300 HAMR (2020)**

Some families have that kid who just happens to be good at everything he tries. He's good at basketball, soccer and track. He's smart, good looking and seems to get all the girls. In the .223 Remington family, that distinction goes to the .300 HAMR.

Designed by Bill Wilson of Wilson Combat, the .300 HAMR is a shortened .223 Remington case that's been necked up to .30 caliber. The cartridge was SAAMI approved in 2020 and will work with bullets weighing between 95 and 150 grains. Essentially, it duplicates or betters the external and terminal ballistics of the .30-30 Winchester and for big-game hunting, outclasses all its siblings.

*Mostly thought of as a hunting cartridge, the .300 HAMR has broad application and maybe the best general-purpose cartridge for the AR-15.*

Like that athletic kid who does well in all sports but is mostly remembered just for one, the .300 HAMR has the same problem. Initially promoted by Wilson Combat as the ideal big-game cartridge for the AR-15, that's the task the cartridge is most often associated with. However, with the wide range of projectiles available—Wilson Combat currently offers 14 loads—including everything from bonded to mono-metal bullets, the .300 HAMR also performs admirably in a tactical setting. Wilson Combat now also has a multi-caliber 30-round magazine that'll work with the .300 HAMR, .300 Blackout and the .223 Remington.

### **.350 Legend (2019)**

The .350 Legend is kind of like that fat uncle who still drives a Chevy Nova, smokes cigars, tells good jokes and drinks all the beer in the

fridge every time he comes to visit. It's a bit of an oddity when it comes to cartridges. Most cartridges are created to deliver a level of external or terminal ballistics unobtainable with the parent cartridge or any other cartridge in the family. While the .350 Legend sort of does that, the prime motivation behind its development was to comply with straight-wall deer hunting cartridge legality in some Midwestern states.

*The .350 Legend is unique in that while a descendant of the .223 Remington, it was created to meet hunting regulations in just a few states.*

Using the .223 Remington cartridge case, Winchester got rid of the shoulder and made the .350 Legend case with only minimal taper down to a bullet diameter of 0.357. This lack of a shoulder and the .35-caliber bullets allowed it to meet straight-wall deer hunting cartridge requirements, and feed and function in an AR-15.

*Designed for states with straight-wall cartridge restrictions for deer hunting, the .350 Legend has surprisingly found nationwide acceptance.*

What might be most surprising about this cartridge is that it has found favor from coast to coast. It offers good big-game hunting performance out past 200 yards with minimal recoil. This makes it a great deer hunting round in an AR-15 or a compact bolt-action rifle for new, young and recoil-sensitive shooters.

#### **.22 Nosler (2017)**

The .22 Nosler (2017) is sort of a crossbreed cartridge. Like in many human families, sometimes there's a bit of cheating going that can result in a bastard. The .22 Nosler isn't based on the .223 Remington case. Instead, it's based on the 6.8 SPC (2002) cartridge case, which is actually a descendant of the .30 Remington (1906).



*The .22 Nosler isn't based on the .223 Remington case, but it does share the same rim diameter, making it an easy conversion for an AR-15 chambered for the .223 Rem.*

But Nosler wanted to make it easy to convert an AR-15 chambered for any cartridge in the .223 Remington family to the .22 Nosler. So, they reduced the rim diameter of the parent 6.8 SPC case from 0.422 inch to 0.378 inch. You could say that the .22 Nosler cartridge case is slightly deformed, because its rim is rebated ... or smaller than the base diameter of the cartridge. From a velocity standpoint, the .22 Nosler approaches the .204 Ruger and outclasses the .223 Remington. The downside is limited availability of factory ammunition.

**Editor's Note:** *This article originally appeared in the June 2021 issue of Gun Digest the Magazine.*

More On .223 Remington:

- Ammo Brief: The Rise Of [.223 Remington](#)
- AR-15 Basics: [.223 Vs. 5.56](#)
- Reloading [.223 Remington](#)
- [.223 For Deer](#)
- [.223 For Home Defense](#)



NEXT STEP: Download Your **Free** Storm Tactical Printable Target Pack

**62 Printable MOA Targets with DOT Drills - Rifle Range in YARDS** This impressive target pack from our friends at Storm Tactical contains **62 printable targets** for rifle and handgun range use. Target grids and bullseye sizes are in MOA. Ideal for long-range shooting!

**Subscribe to the Gun Digest email newsletter and we'll send your print-at-home target pack right away.** Just enter your email address below.

## Around the Web



**It Was the Most Famous Movie Line Ever, but He Was Never Meant to Say It**

YourDIY



**[Alert] Amazon Hates when People from District of Columbia Do This, but They Can't Stop You**

Online Shopping Tools



**The Secret Coin That Could Help You Retire: is It in Your Collection?**

It'sTheVibe

# EXHIBIT 84

# It's the Cartridge, Stupid—Not the Rifle

By Major Anthony F. Milavic, U.S. Marine Corps (Retired)  
August 2002

Proceedings

Vol. 128/8/1,194

ARTICLE

The Marine Corps is considering a change in service rifle from the M-16A2 to either the M-16A4 Rifle or the M-4 Carbine. Unfortunately, all three weapons suffer from a common shortcoming: the impotent 5.56-mm NATO cartridge. Merely changing weapons will not correct its deficiency in lethality.

The 5.56-mm round was spawned by the proposition that volume fire is as effective as aimed fire. Therefore, warriors with lighter-weight cartridges (in terms of physical weight as opposed to impact) could carry more bullets in their same basic load, put out a higher volume of fire, kill more enemy soldiers, and require fewer ammunition replenishments. However, the physical weight advantage of the round is misleading. The 5.56-mm NATO cartridge is approximately half the weight of the cartridge it replaced, the 7.62-mm NATO cartridge; a soldier can carry approximately twice as many 5.56-mm as 7.62-mm rounds. Although the two-to-one advantage is reduced substantially by the weight of the additional magazines, cartridge belts, and pouches needed for the additional ammunition, I will use that ratio here. In any case, it would be an advantage only if the 5.56-mm cartridge had the same one-round knockdown power as its predecessor—and the evidence demonstrates otherwise.

## Field Test

The 5.56-mm cartridge was produced from the Remington .223-caliber commercial round that is advertised for use in groundhog and woodchuck hunting. In 1962, under the aegis of Project Agile, 1,000.223-caliber AR-15 Rifles were given to South Vietnamese soldiers for field testing. The cartridges were credited with scoring "instantaneous" one-shot kills. On 9 June, after ambushing an estimated Viet Cong (VC) company, a Ranger platoon reported five VC killed by the AR-15, with the following one-round lethal hits:



- Back wound, which caused the thoracic cavity to explode
- Stomach wound, which caused the abdominal cavity to explode
- Buttock wound, which destroyed all tissue of both buttocks
- Chest wound from right to left, which destroyed the thoracic cavity
- Heel wound, which was caused by a projectile entering the bottom of the right foot, causing the leg to split from the foot to the hip

All deaths were instantaneous, except for the buttock wound. The VC soldier with that wound lived about five minutes.

The Army Wound Ballistics Laboratory at Edgewood Arsenal was unable to confirm the Vietnam test reports by firing .223-caliber rounds into ballistic gelatin. The laboratory tried a second time using bullets with 1/4 inch cut off their tips and 3/32-inch-diameter holes drilled about 1/4 inch deep into the lead cores. The modified bullets also failed to duplicate the spectacular effects reported by Project Agile. Nonetheless, those unbelievable—and unconfirmed—results served as proof that the .223-caliber bullet had one-round knockdown power. The Department of Defense designated it as the 5.56-mm and made it the primary cartridge for U.S. shoulder weapons.<sup>2</sup>

### Warriors' Reports

For more than 36 years, field reports from soldiers and Marines have provided ample evidence that challenges the basis for choosing the 5.56-mm cartridge:

*Vietnam, 1965.* According to the Army commander of the first U.S. unit to be engaged with major North Vietnamese Army (NVA) forces, "Even after being hit several times in the chest [with 5.56-mm rounds], many continued firing and moving for several more steps before dropping dead." Another infantry officer said, "In one fire fight, I saw my RTO [radio operator] place three rounds [of 5.56-mm] in the chest of a charging NVA regular at 50 yards. He kept firing his AK [Soviet AK-47 Assault Rifle] and never slowed down. At 30 yards, I hit him with a blast of double-ought buck. It picked him up off his feet and he didn't get up again."

*Gulf War, 1991.* A Marine officer reported that "several Marines commented that they had to shoot Iraqi soldiers 2-3 or more times with the 62-grain 5.56mm green tip ammo before they stopped firing back at them.... An Iraqi officer, still on fire, faced the firing line of Marines and charged forward firing his weapon from the hip. He didn't hit anyone, but two Marines each nailed him with a three-- round burst from their M-16A2s. One burst hit him immediately above his heart, the other in his belly button. [He] ... kept right on charging and firing until his magazine

was empty.... The surgeons told me he certainly died of burns, but not necessary from the six 5.56-mm wounds."

*Somalia, 1993.* Army Sergeant First Class Paul Howe, a Delta Force soldier, noted that the 5.56-mm green-tip round made a small clean hole and passed right through the enemy. Unless it happened to hit the heart or spine, it was not enough to stop a man in his tracks. "Howe felt like he had to hit a guy five or six times just to get his attention."

*Afghanistan, 2002.* A soldier who preferred to remain anonymous e-mailed the following account to me in April 2002: "The current-issue 62-grain 5.56-mm (.223) round, especially when fired from the short-barreled, M-4 carbine, is proving itself (once again) to be woefully inadequate as [a] man stopper. Engagements at all ranges are requiring multiple, solid hits to permanently bring down enemy soldiers. Penetration is also sadly deficient. Even light barriers are not perforated by this rifle and cartridge combination."

These reports are consistent with my experience during three tours of duty in Vietnam from 1964 to 1969. It was apparent that the 5.56-mm cartridge was nothing more than the commercial Remington .223 cartridge used for hunting small game. (The state of Virginia does not permit it to be used for hunting deer because it cannot ensure a "clean kill" on deer.) Yet its full-metal-jacket military counterpart continues to be issued to U.S. combatants for the purpose of knocking down and killing or disabling enemy soldiers.

### Unintended Consequences

By institutionalizing the proposition that volume fire is as effective as aimed fire, troops are encouraged to engage single targets with automatic fire and thus use even more ammunition. A Marine told me of an incident he witnessed during the Vietnam War: "In late 1966, I was on an OP [observation post] near Chu Lai with a squad of Marines at the time we transitioned to the M-16 (\*&A%\$ toy). With my binoculars I spotted an NVA courier replete with pouch walking on the edge of a paddy about 300 meters away, pith helmet with red star and all. Suggesting to the Lt. that he intercept the individual, he mistook that as a 'commence fire' command. The lads opened up and most of them had their new toys on full auto. I could see splashes and puffs all around said individual, who was now sprinting rapidly away. I ordered 'cease fire,' grabbed an M-14, sat, and drilled this guy with one shot at about 300 meters plus. ... Then I had the Marines police up the brass—168 rounds fired, one slight [5.56-mm] nick on the target."

### Conclusions

Early judgments that the .223-caliber/5.56-mm round had one-round lethality against enemy soldiers have proved to be without merit. Soldiers and Marines from Vietnam to Afghanistan have witnessed enemy soldiers advancing and firing their weapons after being hit by several rounds of 5.56-mm ammunition. Further, it has been demonstrated repeatedly that the extra ammunition troops are able to carry as a result of the 5.56-mm's lighter weight does not add up to an increase in combat effectiveness. To the contrary, the evidence shows a loss of combat effectiveness overall because warriors need even more rounds than the two-for-one replacement effected by the change to the lighter round.

Replacing the 5.56-mm M-16A2 with a weapon chambered for the same cartridge only will perpetuate the round's deficiency and the increased logistic burden resulting from necessary and consequential higher volumes of fire.

Major Milavic, a former enlisted man, served both in infantry and intelligence assignments.



# EXHIBIT 85

# Texas shooting survivors say gunman was angered by scared kids

BY EDGAR SANDOVAL      TERENCE CULLEN

NEW YORK DAILY NEWS      Updated: Tuesday, November 7, 2017, 1:29 PM

The frightened children made him angrier.

Gunman Devin Kelley yelled, “Everybody is going to die motherf---er,” before he unleashed mayhem inside the tiny Texas church where he killed 26 people including several children, a couple who survived the attack said.

He especially went after the startled kids who begged for help as he continued to shoot them at close range.

“When the children cried next to their mothers, he would return to shoot them more,” Joaquin Ramirez, 50, told the Daily News. “He had more hatred toward the children because they cried.”

Ramirez and his live-in girlfriend Rosanne Solis, 52, were sitting in the third row of the front left side of the First Baptist Church when Kelley entered shortly after 11 a.m. Sunday. They hid under the church benches as the gunman emptied clip after clip of his assault rifle.

He wreaked havoc on the church for 16 minutes, Ramirez said, filling the small house of worship with blood and gun smoke.



Ramirez, 50, survived the Sutherland church shooting by crawling behind Kelley as he continued to shoot people.  
( A SA OVA / WYO K A Y WS)

Kelley — wearing tactical gear and a black facemask with a white skull — walked up and down the aisle, shooting frightened parishioners who tried to seek refuge in the pews.

His youngest victim was 1-year-old Noah Holcombe, whose father, grandparent, aunt and several young cousins were also killed in the attack. Another 20 people were wounded.

Kelley's first target was the video crew stationed in church's rear, who regularly recorded the congregation's sermons to post online.

"He came in very angry," said Ramirez, 50. "Someone said, 'We are being attacked.'"

The next target was Annabelle Pomeroy, daughter of the church's pastor, who was traveling in Oklahoma at the time.





## Deadly mass shooting at Texas church leaves multiple people dead

Kelley shot 14-year-old Annabelle, sitting in the front row, wounding her in the upper body, a still rattled Ramirez said.

"She looked in me in the eyes and said, 'Please help me,'" he said.

All Ramirez could do, however, was tell her to hide under a bench to elude Kelley.

Kelley started to make his way out of the church thinking everyone was dead when he heard Annabelle screaming in pain again.

"The pastor's daughter cried again and he walked back to the front to shoot her," Ramirez said.



Twenty-six people were killed because of the shooting, including an 18-month-old child. (N CK WAGNER/AP)

Fragments from the last shot at Annabelle hit Solis in the shoulder. She told Ramirez to leave her there so at least one of them could survive.

Ramirez said he crawled behind Kelley's back as the madman shot at the congregation's guitar players.

"As I was crawling out I looked at the child, the pastor's daughter," he said. "She was dead."

Ramirez called 911 as soon as he escaped.

The couple's inability to help the frightened children has left both of them shaken.

"It was horrible to see him shoot children and not being able to help them," Solis told the News. "I don't know how we survived."

## Sign up for BREAKING NEWS Emails

[privacy policy](#)

Sign Up

© 2016 New York Daily News